

## Patent Abstracts of Japan

PUBLICATION NUMBER : 02255513  
PUBLICATION DATE : 16-10-90

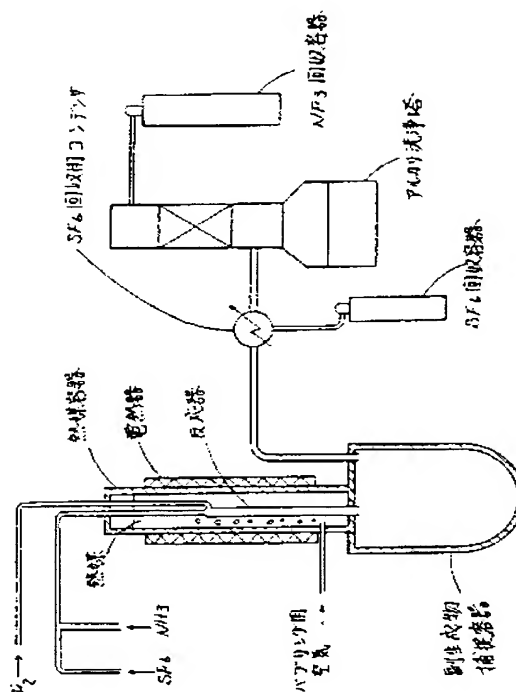
APPLICATION DATE : 28-03-89  
APPLICATION NUMBER : 01074107

APPLICANT : ASAHI GLASS CO LTD;

INVENTOR : SHIMIZU MASAOKI;

INT.CL. : C01B 21/083

TITLE : PRODUCTION OF NITROGEN  
TRIFLUORIDE



ABSTRACT : PURPOSE: To efficiently remove reaction heat and to improve yield by bringing  $\text{NH}_3$  diluted with a specific diluting gas and  $\text{F}_2$  into reaction in a gaseous phase.

CONSTITUTION: A gaseous mixture is obtd. by mixing 1mol  $\text{NH}_3$  and 5 to 100mol  $\geq 1$  kinds of the diluting gases selected from  $\text{SF}_6$ , hexafluoroethane and tetrafluoromethane. This gaseous mixture and the  $\text{F}_2$  is supplied at 5 to 800cm/s flow velocity into the reactor installed in a heat medium kept at 80 to 250°C from the uppermost part thereof in such a manner as to attain 3 to 20mol  $\text{F}_2$  per 1mol  $\text{NH}_3$ , by which  $\text{NF}_3$  and the liquid or solid by-product are formed. The by-product is captured in a capturing vessel. The diluting gas is recovered through a condenser. The gaseous  $\text{NF}_3$  is then scrubbed in an alkali scrubbing column, and recovered in a recovering container.

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# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

PUBLICATION NUMBER : 05105411  
PUBLICATION DATE : 27-04-93

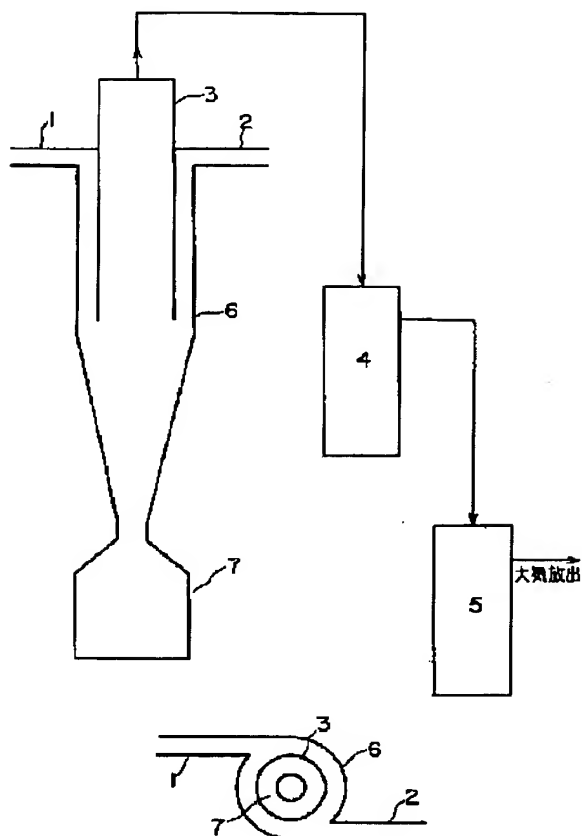
APPLICATION DATE : 22-10-91  
APPLICATION NUMBER : 03274206

APPLICANT : ONODA CEMENT CO LTD;

INVENTOR : KURODA TAKESHI;

INT.CL. : C01B 21/083

TITLE : PRODUCTION OF NITROGEN  
TRIFLUORIDE



ABSTRACT : PURPOSE: To improve reaction efficiency, yield or the like by allowing a gaseous starting material to flow along the inner wall of a reactor in helical form to mix and allow to react when producing nitrogen trifluoride by reacting fluorine gas with ammonia gas in vapor phase.

CONSTITUTION: The raw material blowing pipes 1 and 2 are connected to the reactor 6 so as to enable the gaseous starting material to blow in tangential direction of the cylindrical part of the reactor 6, and ammonia gas and fluorine gas, if necessary adjusted their conc. with a dilution gas, are injected into the reactor 6 from the raw material blowing pipes 1 and 2, are allowed to flow along the inner wall of the reactor 6 in helical form in the inside of the reactor 6 and are sufficiently mixed to allow to react. Next, the reacted gas is drawn out from the formed gas draw-out pipe 3 and is introduced into the gas scrubber 4 to clean, and then, formed nitrogen trifluoride is recovered by the recovering device 5. A solid part of the by-product is stored in the storage vessel 7. As a result, the gaseous starting material is sufficiently mixed and clogging of the reactor and pipe line is eliminated.

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PUBLICATION NUMBER : 03170307  
PUBLICATION DATE : 23-07-91

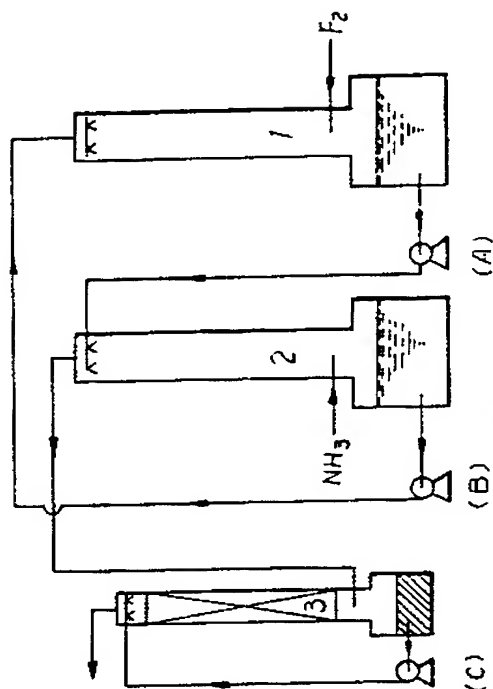
APPLICATION DATE : 27-11-89  
APPLICATION NUMBER : 01307243

APPLICANT : KANTO DENKA KOGYO CO LTD;

INVENTOR : SATO SHIRO;

INT.CL. : C01B 21/083

TITLE : PRODUCTION OF NITROGEN TRIFLUORIDE



ABSTRACT : PURPOSE: To improve the production efficiency of nitrogen trifluoride by introducing F gas after dissolving NH<sub>3</sub> into a perfluorocarbon liquid or by introducing NH<sub>3</sub> gas after dissolving F gas into a perfluorocarbon liquid.

CONSTITUTION: A 6-14C linear or cyclic perfluorocarbon which is liquid at normal temperature (e.g. perfluorohexane) is supplied to the top of an F-dissolution column 1 at a prescribed flow rate with a pump (B). At the same time, F gas is supplied to the column 1 from the bottom at a prescribed flow rate to accumulate the perfluorocarbon liquid containing dissolved F gas at the column bottom. NH<sub>3</sub> gas is introduced to the bottom of a reaction column 2 at a prescribed flow rate while supplying the accumulated perfluorocarbon liquid containing little dissolved F gas to the top of the column 2 with a pump (A). When perfluorocarbon liquid containing little dissolved F gas is accumulated in a liquid reservoir of the reaction column 2, the liquid is supplied to the F-dissolution column 1 with the pump (B) to dissolve F gas again in the liquid. In the course of the above circulating process, NH<sub>3</sub>, HF, N<sub>2</sub> and unreacted NH<sub>3</sub> are distilled out from the top of the reaction column 2 and supplied to a scrubbing column 3 containing 10% KOH aqueous solution circulating in the column. HF and unreacted NH<sub>3</sub> can be removed by this process to obtain objective NF<sub>3</sub>.

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